8th World Congress 2010
Participatory Action Research and Action Learning 6th - 9th September, Melbourne, Australia

PAR and the prevention of delirium in older people in the acute care setting: Outcomes and meaning of participation

Isabel Higgins, School of Nursing and Midwifery, University of Newcastle

Pui Li, John Hospital Hunter New England Health

Jenny Day, School of Nursing and Midwifery, University of Newcastle

Michelle Giles, John Hospital Hunter New England Health

Fran Dumont, John Hospital Hunter New England Health

ACKNOWLEDGEMENTS

The authors would like to acknowledge the health care professionals and researchers who actively participated in the PAR pilot study and who continue to redesign their clinical practice using the actions from this PAR process. The authors also acknowledge the support of the School of Nursing and Midwifery, Faculty of Health, Newcastle University, Australia and the Division of Medicine at the John Hunter Hospital, Newcastle, Australia.

Note: Parts of this manuscript have been published in the following monograph as:

Li, P., Giles, M., Dumont, F. Day, J. Higgins, I. (2009) The uptake and utility of a protocol for delirium prevention: An evaluation study. HNEHandover, 7-11.

I. INTRODUCTION

The aims of this paper are to outline the background and purpose of a participatory action research (PAR) project, conducted as a pilot study that was designed to use a partnership approach to the prevention and early detection of delirium in older people in the acute hospital setting. In this paper we describe how PAR was used, actions from the PAR process, how sustainability was evidenced and reflections of clinicians who participated in the project.

II. BACKGROUND TO THE PROJECT

This project was a conceptualised as a consequence of a program of study undertaken by Tina Koch in 2005 known as the "kick starting the older person research program". In this program of research the research question was "what are the concerns, claims and issues surrounding older person care" for health care staff employed with a large area health service in NSW Australia? The method for the study included interviews with sixty key stakeholders from within the Hunter New England Health Service. Stakeholders from a range of setting and areas of the health service were interviewed over a period of 8 months in 2005. The top priority and concern for these stakeholders was how best to care for older people with delirium. This then became the top research priority for the older person program of research.

III. THE PROBLEM OF DELIRIUM

Delirium is a common condition experienced by older people who are medically ill and admitted to acute care hospitals (Adamis, 2006). It is an acute condition that may last a few hours or take weeks to resolve (Blazer, 2008) and is characterised as an acute confusional state that "develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day" (American Psychiatric Association Diagnostic Criteria from DSM-IV, 1994, p. 84)

Delirium is often misdiagnosed and falsely attributed to dementia or depression (Inouye, 2007; Schuurmans, 2001; O'Keeffe, 1999), or is not detected at all (Maher, 2002). Nurses and medical practitioners also mistake the signs and symptoms of delirium as signs of normal ageing (Schuurmans, 2001). Non-detection rates for delirium have been reported to be between 32-67% (Inouye, 1994). With the underlying cause or causes of delirium overlooked, the older person's illness is undertreated and mismanaged (Schuurmans, 2001). As a result there is increased risk of morbidity and mortality amongst older patients and increased length of hospital stay and time for rehabilitation resulting in ever-increasing health care costs (Young & Inouye 2007). It also impacts on the older person's quality of life.

At admission to hospital the occurrence of delirium in older people is reported to be between 14 and 24 per cent, whilst during hospitalization it is reported to be between 6 to 56 per cent (Inouye, 2006). Among general medical inpatients, the incidence is between 11 and 42 per cent (Inouye, 2007). Between 60 and 80 per cent of hospitalized older people experience at least one preventable episode of delirium (Gillis & MacDonald, 2006) and 30 to 90 per cent are discharged from hospital with the delirium unresolved (Foreman, Wakefield, Culp, & Milisen, 2001).

Delirium can be prevented during hospitalization with judicious assessment and management of the predisposing and precipitating factors (Inouye, 1999; Inouye, 2006; Weber, 2004). Prevention of delirium reduces its frequency and the associated complications and adverse events of acute hospitalization such as death, falls, and pressure areas (Inouye, 2006). Prevention strategies for delirium focus on identifying and reducing predisposing and precipitating risk factors through the use of multi-component intervention strategies (Inouye et al's., 1999; Inouye, 2006; Milisen, 2005).

Unfortunately there is a gap between the uptake of best practice guidelines and clinical practice (Grol, 2004). Studies show that up to 20% or more of the care given is either unnecessary or it is potentially harmful, whilst 30% to 40% of patients' care is not based on scientific best practice (Grol, 2003). The outcomes of the PAR project discussed here achieve some gains in terms of the uptake of best practice guidelines.

IV. WHAT WE DID AND WHAT WE ACHIEVED

In this study we used Koch and Kraliks' (2006) approach to PAR, which focuses the importance of storytelling as a way of looking, thinking and acting towards reform and change. The participatory action research (PAR) group comprised clinical nursing and allied health staff and academic researchers during a research pilot study in 2007. We explored how clinicians might redesign practice for the care of older people with delirium (Day, Higgins & Koch, 2008, 2009a,b). The ward for the study was a 32 bed acute care medical ward in a large teaching hospital in NSW Australia.

V. ETHICAL CONSIDERATIONS

Ethics approval was given to proceed with both the PAR study and the subsequent evaluation study by the Area Health Service ethics committee. Permission was also obtained from the hospital Executive and Divisional Manager and the Nursing Unit Manager of the ward selected. Participants were informed that participation was voluntary and that they could withdraw from the study at any time. Consent for participation in the evaluation survey was implied through the return of questionnaires to the researchers. Consent for participation in the PAR group and focus group for the evaluation study was sought in writing. Data from audits was de identified. Confidentiality was assured for all data sources

During the PAR process we held weekly meetings with the 8 consenting clinicians. PAR is a process in which researchers and participants systematically work together in a group in cycles of 'looking, thinking and acting' in order to bring about practice change. Its primary purpose is to produce practical solutions that are useful to people. Action research is about working towards practical outcomes, creating knew knowledge. A wider purpose is to enhance well-being – politically, economically, psychologically and spiritually. Its aims are to enhance equity and sustainability of action. The looking phase builds a picture. It is about gathering information about the condition, from practice stories and in the context of this study, from evidence based literature. During the thinking phase participants receive feedback provided by researchers from previous PAR sessions & they are facilitated to reflect, interpret and explain what they see. The thinking phases occur through continuous feedback with a feedback document recorded as minutes, which also provide preliminary analysis of work in progress. Using this approach the PAR group generated three data sets including:

PAR group and debrief meeting data and analysis using the look, think and act process, audit data, and descriptive analysis of this data set.

The outcomes from this part of the project have been reported elsewhere (Day, Higgins & Koch, 2008, 2009a, b). In summary they were:

Constraints to practice were identified including:

- Delayed transfer of older patients from the Emergency Department to the medical ward. Times for delay ranged from 4.5 to 25 hours.
- Some ward routines, such as late evening medication rounds disrupted sleep times for older people. Family members visiting times were restricted with visitation rights limited in the emergency setting. Family members can help to orientate older people who are confused and critically ill. Were not encouraged to stay with older people elatives
- Inadequate and inappropriate assessment of older patients at risk of delirium
- Managers were under increasing pressure to reduce hospital length of stay which meant they were transferring older patients out of the acute care ward and hospital prematurely

The clinicians changed their usual practices relating to older patients:

- Clinical staff designated a four-bedded ward within the facility a "Delirium room" whereby older people at risk of delirium and or with a diagnosis of delirium were "specialled". This meant they received appropriate assessment for early detection and prevention of delirium and appropriate nursing interventions including the reduced use of physical restraints.
- Clinicians in the PAR group developed and implemented a Delirium Alert Protocol which as placed on the bedside charts of all older patients (see Figures 1&2)

An estimation of the incidence of delirium and the patients who were likely to have delirium but were missed using an audit of all older patients charts or notes over a period of 15 days.

- Findings of the chart audit revealed 1pt (2.7% n=48) with a formal diagnosis of delirium and 8 (22% n=48) patients suspected of having delirium.

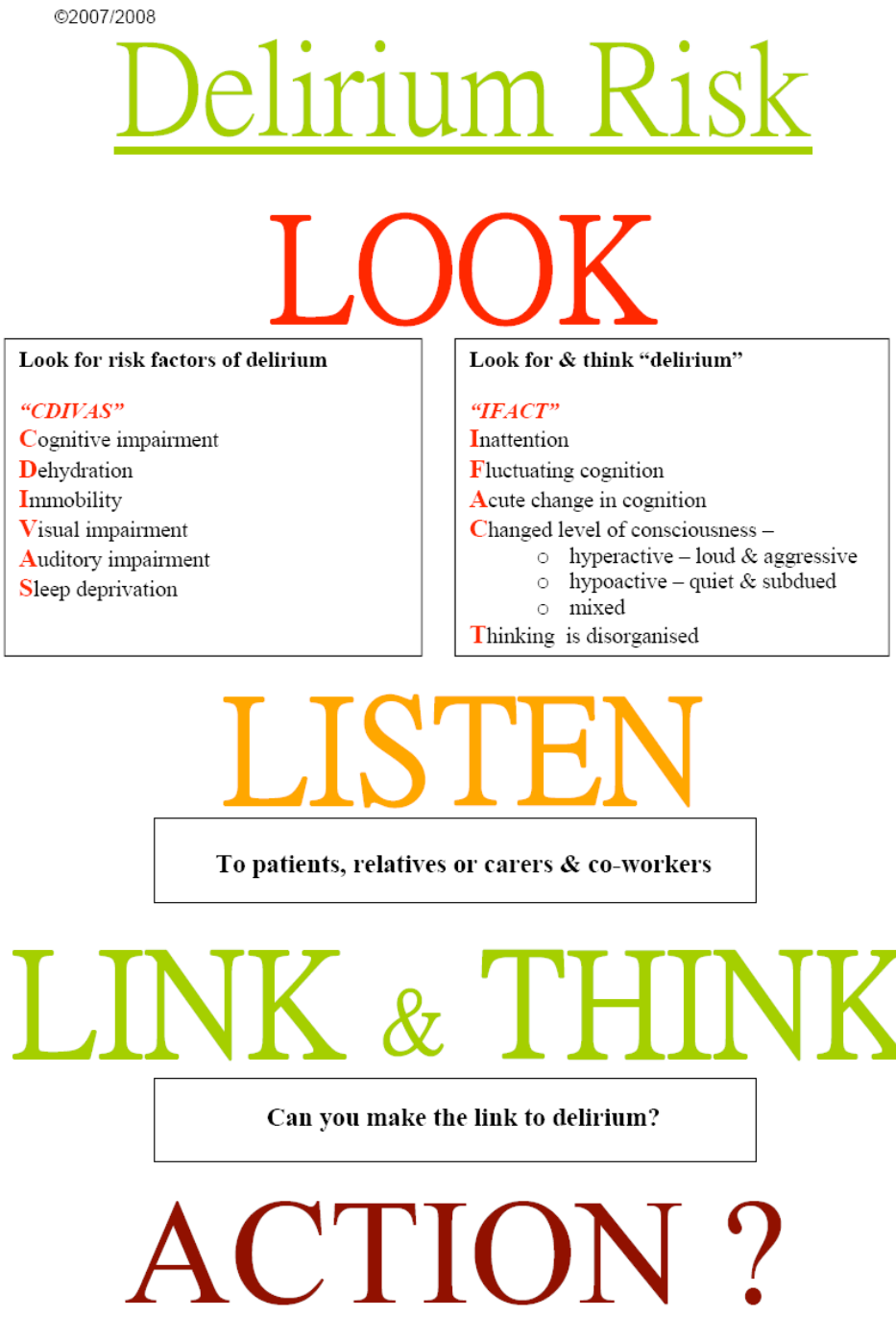


Figure 1. Front page of DAP

©2007/2008 Delirium Awareness – Risk Factors & Interventions
All patients admitted to J3

On admission: Assess normal for all risk factors & how the patient currently presents.
Document ongoing reviews & strategies used.

Risk Factor Assessment	Standardised Intervention Protocols	Targeted Outcome
Cognition / Orientation If possible Mini Mental Test (MMSE) & Confusion Assessment Measure (CAM). Record inattention, language disturbance.	*Orientation*: reorient to surroundings (call bell, bed, room, clock, ward, other pts). Provide the day's schedule. Consider orientating to daily news / TV. Attempt continuity of care. Involve carers & family.	Early identification of cognitive changes. Improved orientation. Pt knows way around room & ward.
Hydration Dehydration identified by electrolyte imbalance (UECs), dry tongue/mouth, poor skin tone. Routine UA, O^2 saturation, JVP. Monitor fluid intake & loss. Observe for oedema.	*Dehydration*: continuous assessment for early recognition of dehydration & volume reception. Regularly offer drinks (except pts on fluid restriction). Ensure drinks are accessible – provide aids as needed. Address volume depletion with IV/SC fluids as ordered. Complete fluid balance.	Adequate hydration. UECs within normal limits. Satisfactorily fluid balance. Improved skin integrity. Tongue moist. Urinalysis within norms.
Mobility Physio & nursing mobility assessment. Document sudden decrease in mobility.	*Early safe mobilisation:* either bed exercises or walk. Walker/stick, glasses, slippers at hand. Mobilise to toilet/shower with commode, then walking. Encourage pt to call for assistance/supervision when needed. Consider differing needs for day & night. Minimise physical restraint.	Improved mobility. Improved potential changes in enablement & activities of daily living skills.
Vision Pts with glasses/poor vision identified. Identified level of impairment.	*Pts who wear glasses:* ensure glasses are present, clean & on/encourage use. Tape or tactile aid on nursing alert bell - ensure accessibility. Clutter removed from environment. Assist with menu & eating/drinking. Ensure adequate lighting. Introduce other pts	Decreased risk of injury. Sense of enablement. Pt actively takes part in daily activities on ward.
Hearing Pts with aids/poor hearing identified. Identified level of impairment. New hearing loss identified.	*Pts with hearing aids*: ensure aids are present, clean, fitted, turned on, working battery & in/encourage use. Face pt & speak clearly toward good ear. Use picture boards, written messages etc or portable amplifying devices where necessary. MOs check for wax build up.	Improved / maintained hearing, communication, participation. & orientation. De-impaction of ear wax.
Sleep Assess sleep daily. Record changes to sleep pattern from home & during admission.	*Non pharmacologic:* at bedtime offer warm drink (milk & honey or herbal tea), make comfortable (warm or cool), toilet, decrease stimulation, minimise noise, lights off at 2000-2100. Plan admissions before dark. *Pharmacologic:* Check medication time & reschedule drug administration to 1800 as able. Ensure effective analgesia.	Normal sleep pattern maintained. Change in use of medication to achieve sleep.
Elimination Documented daily elimination patterns - voiding & bowels – evaluate against normal pattern.	*Voiding*: U/A on admission. Document colour, volume, odour & voiding S&S. Monitor temperature. Time & volume chart. Avoid catheterisation. *Bowel regimen*: check regularly for constipation / consider constipation with overflow. Document if bowels have not been open. Implement aperients as needed. Mobilise to toilet. Encourage commode overnight.	Decreased risk of Urinary Tract Infection. Decreased risk of constipation
Medication Medication review against pre-admission regime.	*Pharmacologic*: monitor for additions & interactions between routine & prn meds. Watch for side effects from adding medications/sudden withdrawal. *Non pharmacologic:* consider interventions other than medications	Decrease use of medications. Minimised medication side effects.
Prevent Iatrogenic Risk of individual iatrogenic events – falls, pressure areas, medication error.	*Falls Prevention assessment & protocols*: minimise physical & chemical restraint, safe environment. *Pressure Area assessment & protocols* *Medications error prevention protocols*	No iatrogenic events. Safe & independent movement maximised.
Nutrition Functional & motivational barriers.	*Function:* glasses on, teeth in/working/fitting/comfortable, sit up/sit out of bed, open packages, one item at a time, assist with feeding, FBC, speech pathology/dietician consult. *Other:* encourage/praise, evaluate taste.	Adequate nutrition & fluid intake.

Source: Inouye, S.K., Bogardus, S.T., Charpentier, P.A., Leo-Summers, L., Acampora, D., Holford, T.R. and Cooney, L.M.(1999) A multicomponent intervention to prevent delirium in hospitalized older adults. *New England Journal of Medicine,* 340:9 Table 1 p671

13th July 2007

Figure 2. Back page of DAP

Twelve months later we evaluated the uptake and utility of one of the outcomes of the PAR project, the Delirium Alert Protocol by nursing staff. The research questions for this part of the study were:

- Has the DAP increased staff members' knowledge about delirium, its prevention and detection?
- Are clinical staff members aware of the risk factors for delirium?
- Is the DAP utilised by clinical staff?

- Has there been an increase in the use of preventative nursing strategies for delirium?
- What are the staff members' perceptions of the utility of the DAP?
- What are the staff members' perceptions of the impact of the DAP?
- What impact has the protocol had on the identification of delirium?

We conducted a retrospective audit of patients' charts (post-DAP audit) to compare the audit of patients' charts conducted in the 2007 PAR pilot project (pre-DAP audit). A questionnaire was developed and designed to explore the uptake and utility of the DAP on the ward amongst nursing staff. All nurses working on the ward were invited to complete the questionnaire which included questions relating to awareness of delirium and the DAP and its perceived utility. The focus group explored the perceptions of clinicians from the 2007 pilot regarding changes in practice following the implementation of the DAP. Nine clinical staff members who participated in the PAR project were invited to participate in the focus group interview.

VI. Results from the pre and post-DAP audits are presented in the table 1 and figure 3.

TABLE I. TABLE 1: PATIENT DEMOGRAPHICS

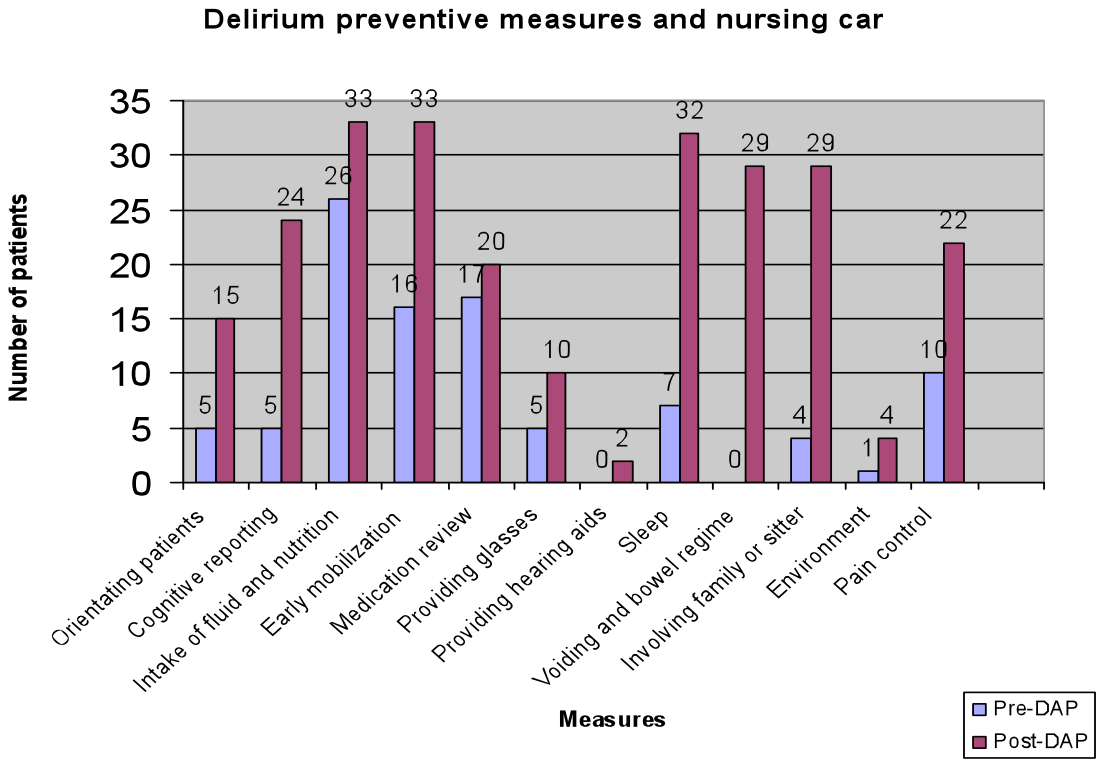
Patient demographics	Pre-DAP n= 37	Post-DAP n= 37
Gender	19 male (51%) 18 female (49%)	15 male (41%) 22 female (59%)
Age	Range 29-95 years* Mean 56 years Median 80 years	Range 65-99 years Mean 81 years Median 81 years
LOS	Range 2-49 days* Mean 10 days Median 27 days	Range 1-27 days Mean 11 days Median 9 days

*During the 2007 PAR project, flooding in surrounding areas resulted in an increased length of stay (LOS) for patients from the local area. In light of this we did not compare (LOS) data.

Whilst the purpose of the DAP was to raise awareness of delirium and its prevention there was an increase in the diagnosis of delirium recorded in the patient charts. In the pre- DAP audit, one patient had a formal diagnosis of delirium identified during the emergency phase of their admission compared to the post-DAP group where five patients had a formal diagnosis of delirium. Whilst this result can not be directly attributed to the DAP it was encouraging to find delirium documented as a diagnosis on several occasions.

Pre and post-DAP documentation of nursing interventions for the prevention of delirium were compared (see Figure 1). There was an increase in overall nursing interventions documented.

Figure 3. Pre and Post-implementation of the DAP Preventive measures and nursing care for Delirium



The nursing staff questionnaire was distributed to all clinical nursing staff on the ward (n=37). Twenty-two of the staff (85%) aware of the DAP. Seventy three percent (n=19) of staff reported that the DAP was easy to understand and 65% (n=17) reported that it was easy to follow when they first encountered it. When asked if the DAP was easy to explain to others, 58% (n=15) agreed, 15% (n=4) were undecided and 8% (n=2) disagreed. Forty six per cent (n=12) believed the DAP had changed the way they assessed patients. Fifty four per cent (n=14) of staff perceived they had a greater awareness of the risk factors for delirium with 50% (n=13) aware of the subtypes of delirium (see table 3). Fifty per cent of the staff indicated that they referred to the DAP often or always. Overall, 65% (n=17) of the staff believed the DAP was useful in identifying patients with delirium and 65% agreed that the DAP was a practical tool. Sixty nine per cent (n=18) of staff believed the DAP should be kept in its current form.

TABLE II. NURSING STAFF DEMOGRAPHICS

Staff Demographic	N=26
Classification	
Registered Nurse	18 (69%)
Enrolled nurse	6 (23%)
Assistant in Nursing	2 (8%)
Years of experience:	
<1	3 (12%)
1-2	4 (15%)
3-5	5 (19%)
6-8	2 (8%)
>8	12(46%)

TABLE III. STAFF KNOWLEDGE

Survey results	Before the implementation of DAP (n=26)	After the implementation of DAP (n=22)
Knowledge about subtypes of delirium:		
Hyperactive	10 (39%)	13 (59%)
Hypoactive	5 (19%)	12 (55%)
Mixed	7 (27%)	13 (59%)
Awareness of risk factors of delirium	15 (58%)	14 (63%)

VII. REFLECTIONS

About the PAR process clinicians said:

- We were motivated by the idea of action: it was very appealing. We like the idea of being able to improve care for older people. When patients were confused, loud and aggressive we found caring for them challenging and distressing. Their behaviour also distressed and unsettled other patients and family members. The idea of preventing delirium was also appealing for this reason.
- We now use the "delirium" word at handover. Following the PAR project and the introduction of the DAP; participants were more conscious of the possibility that a patient might have delirium or that they may have risk factors for delirium.

So when they [referring to medical staff] say, "oh they're a bit confused", I'd say, "so we're talking delirium here? Or are we talking dementia? What are we talking here?" And it's usually, they'd [medical officer] say," oh, it probably is delirium, or it is delirium, because they're uroseptic or whatever."

- We take an active role: recognising the "triggers". Participants pay more attention to assessing patients for risk factors of delirium and that they were pro active in relation to this.

People [nursing staff] are actively saying at every handover, "bowels open, bowels not open", and then saying, "it's been three days, we need to do something about this". So things are being passed on, because that's our primary [concern] with delirium, those are the triggers that we've noted over the last year or so, since we've taken an active role in recognising the triggers.'

- Participants also believed that that there were important changes in nursing care and improved patient outcomes, particularly in the use of physical and chemical restraints, and a multidisciplinary approach to care.

We don't use restraints a lot any more, It's really different management; the actual use of restraint, because they have developed delirium on the ward, it is, I would say, nearly non-existent, I'd be comfortable in saying that it would be nearly non-existent now..//..So we're starting to get the interrelationships going on between the… multidisciplinary team.

- There are ongoing challenges for all of us.

It's a challenge to the ward to continue to put it [delirium prevention] forward… every new person who comes or someone who doesn't work here regularly [needs to be reminded of the prevention of delirium and the DAP] So you're kind of leading them

[with reference to the resident medical officer] a little bit along that way. Because our doctors rotate every two months it is a bit of a challenge.

- The PAR process was useful because it helped us to look beyond what we do every day to become more innovative and less constrained by routine. It was also empowering because we learned what did not know and we learned more about delirium and our practice.

PAR was a useful tool allowing us to look 'outside the square'. Because we have 'managed' a situation one way for a long time does not mean that is the only way to 'manage' the situation. (PAR group participant from Li et al., 2009, 2010)

It's showing us to extend our thinking a little bit further. I'm looking at all these points instead of maybe just one or two. It also clarifies your expectations for new staff, or anyone who comes. You can say well, this is the way we approach this, and immediately you set the mark for where you want them to be, and where you want their practice to be, and they go 'okay, righto, they're on the ball here.' It really does help articulate that quite clearly.

VIII. CONCLUSION

The findings of this study highlight the potential for practitioner led adaptation of best practice guidelines and suggest PAR, used to develop the DAP, may be an effective approach to practice change. In addition, the apparent utility of the DAP provides insight into ways in which practitioners might adapt evidence based guidelines for practice. Given that the DAP focuses on risk factor identification and multidisciplinary approaches to the prevention of delirium it may pave the way forward for more comprehensive and effective assessment of all older patients in the acute care setting. Further research needs to be directed towards exploring the potential of practitioner led change on the health outcomes for older people. The effectiveness of the DAP also needs to be implemented and evaluated in other relevant acute care settings.

Of significance is that through the use of PAR to prevent delirium we know that:

- prevention of delirium is preferable to its management
- the innovations from the PAR process have reduced the suffering of older patients and their families
- the changes to practice have likely reduced the costs of health care
- the DAP itself, developed by and for clinicians, is compatible with the values, norms and needs of clinicians
- the DAP is simple to use and easily adopted
- there are no risks associated with its use
- the practice innovations did not increase the work of clinicians

Finally, the DAP is explicit in its simplicity which also means it can be transferred from one context to another.

REFERENCES

Adamis, D., Treloar, A., Martin, F., & Macdonald, A. (2006). Recovery and outcome of delirium in elderly medical inpatients. *Archives of Gerontology and Geriatrics, 43*(2), 2289-2298.

American Psychiatric Association. (2000). Diagnostic and Statistical Manual of Mental Disorders (4th ed.) Text Revision (DSM-IV-TR). Retrieved 30th September 2008, from

http://0www.psychiatryonline.com.library.newcastle.edu.au/resourceTOC.aspx?resourceID=1.

Blazer, D. G. (2008). Treatment of seniors. In R. E. Hales, S. C. Yudofsky & G. O. Gabbard (Eds.), *The American Psychiatric Publishing Textbook of Psychiatry, [online]* (5th ed.). Arlington, VA: American Psychiatric Publishing, Inc.

Creswell, J.W. & Plano Clark, V.L. (2007). *Designing and conducting mixed methods research*. London: Sage.

Day, J., Higgins, I., & Koch, T. (2008). Delirium and older people: What are the constraints to best practice in acute care. *International Journal of Older People Nursing, 3*, 170-177.

Day, J., Higgins, I., & Koch, T. (2009a). The process of practice redesign in delirium care for hospitalised older people: A participatory action research study. *International Journal of Nursing Studies, 46*, 12-21.

Day, J., Higgins, I., & Koch, T. (2009b). Delirium in older people in acute care. In R. Nay & S. Garratt (Eds.), *Interdisciplinary care of older people: Issues and innovations*: Elsevier.

Foreman, M.D., Wakefield, B., Culp, K. & Milisen, K. (2001). Delirium in elderly patients: An overview of the state of the science. *Journal of Gerontological Nursing, 27*(4), 12-20.

Gillis, A., & MacDonald, B. (2006).Unmasking Delirium: Nurses can play a key role in the prevention, detection and treatment of delirium in older adults. *Canadian Nurse. 12*(9) 19-24.

Grol, R. & Grimshaw, J. (2003) From best evidence to best practice: effective implementation of change. *Lancet, 362,* 1225-1230.

Grol, R. & Wensing, M. (2004). What drives change? Barriers to and incentives for achieving evidence-based practice. *MJA, 180*, s57-60.

Inouye, S. (1994) The dilemma of delirium: Clinical and research controversies regarding diagnosis ad evaluation of delirium in hospitalised elderly medical patients. *American Journal of Medicine, 97*, 278-87.

Inouye, S.K., Bogardus Jr., S.T., Charpentier, P.A., Leo-Summers, L., Acampora, D., Holford, T.R. & Cooney, L.M. (1999) A multicomponent intervention to prevent delirium in hospitalized older patients. *New England Journal of Medicine, 340*(9), 669-76.

Inouye, S. K. (2006). Current concepts: Delirium in older persons. *The New England Journal of Medicine, 354*(11), 1157-1165.

Inouye, S. & Young, J. (2007) Delirium in older people. *BMJ, 334*(334), 842-6.

Li, P., Bashford, L., Schwager, G., Spain, R. Ryan, H. Oakman, M., Firth, J., Lockyer, M., Harper, D., Higgins, I. (2009) Reflections on participating in an action research study. HNEHandover, *26-31*

Li, P., Giles, M., Dumont, F. Day, J. Higgins, I. (2009) The uptake and utility of a protocol for delirium prevention: An evaluation study. HNEHandover, *7-11*.

Li, P., Bashford, L., Schwager, G., Spain, R. Ryan, H. Oakman, M., Firth, J., Lockyer, M., Harper, D., Higgins, I. (in press accepted May 2010) Clinician's experience of participating in an action research study. Journal of Contemporary Nursing. 35(1).

Maher, S., & Almeida, O. (2002). Delirium in the elderly. *Current Therapeutics, March*, 39-45.

Milisen, K., Lemiengre, J., Braes, T. & Foreman, M.D. (2005). Multicomponent intervention strategies for managing delirium in hospitalized older people: systematic review. *Journal of Advanced Nursing, 52*(1), 79-90.

O'Keeffe, S. & Lavan, J. (1999) Clinical significance of delirium subtypes in older people. *Age and Ageing, 28*(2), 115-119.

Rolfe, G. (1996). Going to extremes: Action research, grounded practice and the theory-practice gap in nursing. *Journal of Advanced Nursing, 24,* 1315-1320.

Schuurmans, M., Duursma, S. & Shortridge-Baggett, L.M. (2001) Early recognition of delirium: review of the literature. *Journal of Clinical Nursing, 10*(6), 721-729.

Tashakkori, A., Teddlie, C. (1998). Mixed methodology: Combining qualitative and quantitative approaches. Applied Social Research Methods Volume 46. London: Sage.

Weber, J. B., Coverdale , J. H., & Kunik, M. E. (2004). Delirium: Current trends in prevention and treatment. *Internal Medicine Journal, 34*(3), 115.

Young, J., & Inouye, S. K. (2007). Delirium in older people: Clinical review. *BMJ, 334*(7598), 842-846.